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INTERACTIVE ENVIRONMENTAL IMPACT COMPUTER SYSTEM (EICS). USER MA--ETC(U)
SEP 79 R BARAN, R D WEBSTER

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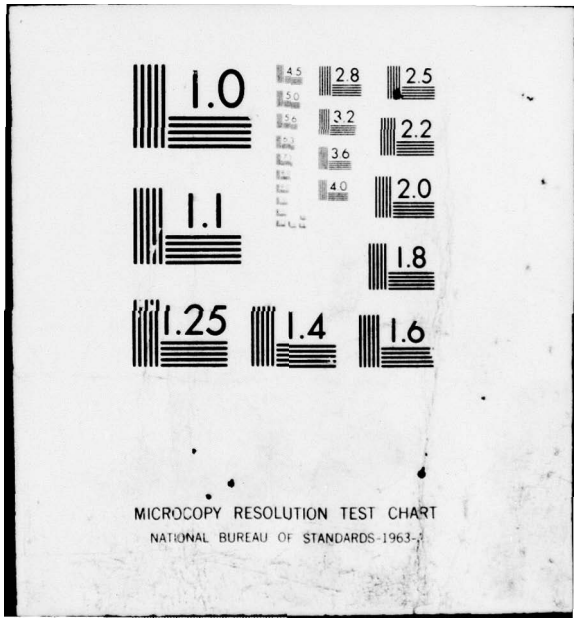
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TECHNICAL REPORT N-80
September 1979

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INTERACTIVE ENVIRONMENTAL IMPACT COMPUTER SYSTEM (EICS) USER MANUAL

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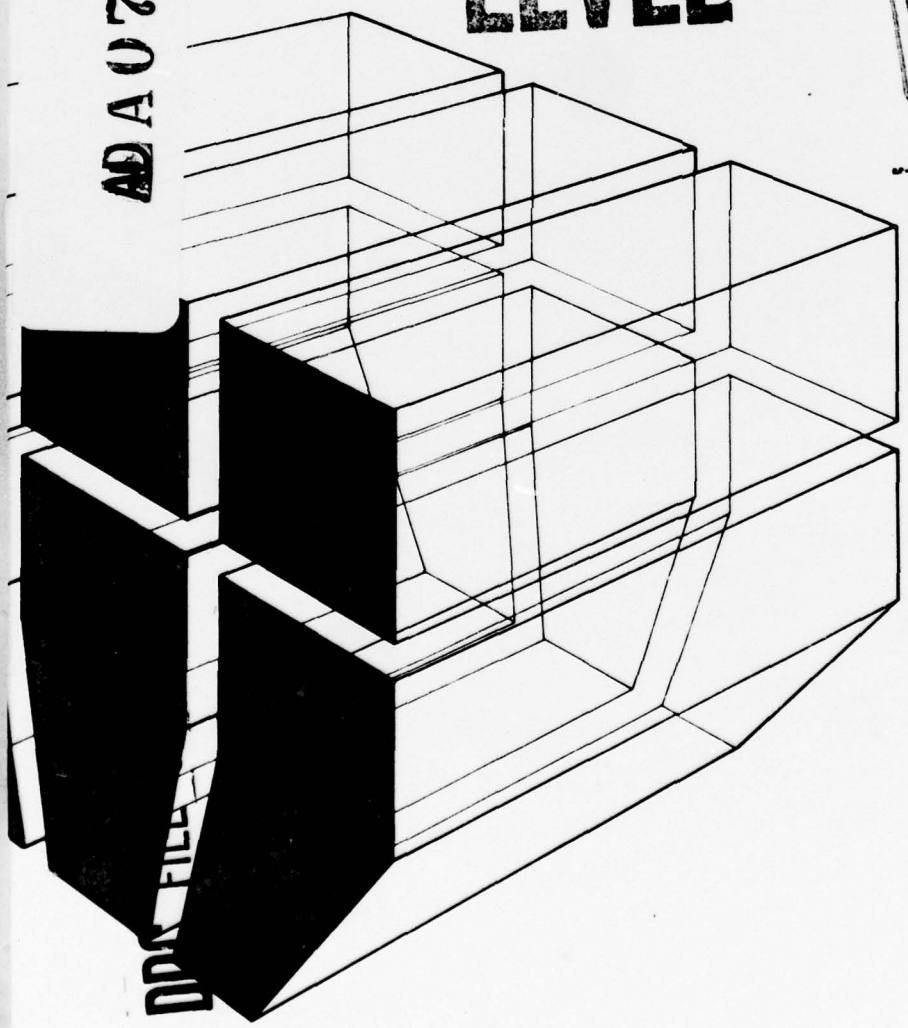

by
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NOTICE

THIS REPORT DESCRIBES A COMPUTER-BASED SYSTEM WHICH IS IN THE PROCESS OF BEING TRANSFERRED TO AN OPERATING AGENCY FOR PRODUCTION USE, TRAINING, AND MAINTENANCE. HOWEVER, UNTIL THE PROCESS IS COMPLETED CERL HAS BEEN AUTHORIZED TO WORK WITH DOD USERS IN EXTENDING THE FIELD TESTING OF THE SYSTEM. THIS ARRANGEMENT PROVIDES FOR CERL STAFF ASSISTANCE TO THE USER ON A COST REIMBURSABLE BASIS AND ON A STAFF AVAILABLE BASIS. THE DETAILS FOR MAKING SUCH AN ARRANGEMENT ARE DESCRIBED IN THE REPORT.

WHEN THE TRANSFER IS COMPLETED THE OPERATING AGENCY WILL PROVIDE THESE SERVICES.

Louis J. Circeo

LOUIS J. CIRCEO
Colonel, Corps of Engineers
Commander and Director

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report describes the Environmental Impact Computer System (EICS) and provides instructions for obtaining and using output for the current interactive version of the system. It is recommended that the instructions be used to obtain the most efficient use of the system.

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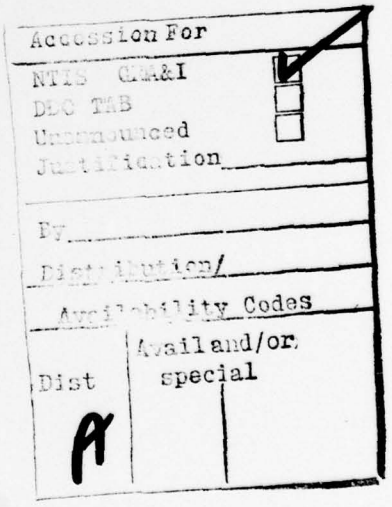
FOREWORD

This project was performed for the Directorate of Military Programs, Office of the Chief of Engineers (OCE), under Project 4A762720A896, "Environmental Quality for Construction and Operation of Military Facilities"; Task 01, "Environmental Quality Management for Military Facilities"; Work Unit 002, "Development of Environmental Technical Information System." The applicable QCR is 1.03.006. Mr. V. Gottschalk, DAEN-MPE, was the OCE Technical Monitor.

This research was made possible through the efforts and support of OCE personnel, consultants from the University of Illinois, and scientists and engineers of the Environmental Division (EN), U.S. Army Construction Engineering Research Laboratory (CERL).

Administrative support and counsel were provided by Dr. R. K. Jain, Chief of EN. COL L. J. Circeo is Commander and Director of CERL, and Dr. L. R. Shaffer is Technical Director.



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1 INTRODUCTION

Background

The 1969 passage of the National Environmental Policy Act (NEPA),[1] which was intended to insure that the environmental impacts caused by new Federal projects or actions are examined as closely as other technical and economic considerations, placed new responsibilities on Army planners. To respond to these new responsibilities,[2] the U.S. Army Construction Engineering Research Laboratory (CERL) developed the Environmental Technical Information System (ETIS).[3] ETIS is a computerized system that provides information useful in preparing environmental impact assessments and statements (EIAs/EISs). Three major subsystems are currently available: the Environmental Impact Computer System (EICS);[4] the Computer-Aided Environmental Legislative Data System (CELDS);[5] and the Economic Impact Forecast System (EIFS).[6] EIFS and CELDS are available to field and headquarters personnel either through CERL or via direct use on an interactive basis. The original version of EICS was oriented toward batch operation, in which the system user sent input and received output by mail. However, user acceptance of the Interactive EIFS and CELDS made the advantage of an interactive EICS apparent, and reprogramming of EICS was begun.

Objective

The objective of this report is to provide DA environmental personnel with the information needed to use the interactive EICS.

Approach

The same matrix format used in the original batch version of EICS was used for the interactive version. User output was broken into smaller units, filtering mechanisms were made interactive, and the system was implemented into the existing ETIS shell.

Chapter 1 discusses the background of EICS and the objectives of this report. Chapter 2 discusses the use of EICS output. Chapter 3 discusses the procedures to obtain EICS output interactively, and Chapter 4 contains the conclusions and recommendations.

Mode of Technology Transfer

The information in this report will be issued as a DA Pamphlet in the 200 series and as the module called EICS in the remote terminal ADP system entitled Environmental Technical Information System (ETIS).

2 EICS DESCRIPTION AND EXAMPLE

System Description

EICS enables a user to determine how an Army action may affect various aspects of the environment. System documentation includes assistance in addressing these effects in an EIA/EIS. Output is provided in matrix format. The matrix describes the complex relationships between the two basic elements of EICS: Functional Areas and Environmental Technical Specialties.

EICS considers nine broad areas (Functional Areas) of Army military activities: Construction; Mission Change; Operations and Maintenance; Training; Industrial; Research, Development, Test, and Evaluation; Procurement; Real Estate; and Decision/Policy-Making.

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[1] *National Environmental Policy Act of 1969*, 83 Stat 852, 42 USC 4321, et seq. (January 1970).

[2] *Environmental Protection and Enhancement*, AR 200-1 (Department of the Army, 7 December 1973).

[3] R. D. Webster, R. L. Welsh, and R. K. Jain, *Development of the Environmental Technical Information System*, Interim Report E-52/ADA009668 (U.S. Army Construction Engineering Research Laboratory [CERL], April 1975).

[4] L. V. Urban, H. E. Balbach, R. K. Jain, E. W. Novak, and R. E. Riggins, *Computer-Aided Environmental Impact Analysis for Construction Activities–User Manual*, Technical Report E-50/ADA008988 (CERL, March 1975); E. W. Novak and R. E. Riggins, *Computer-Aided Environmental Impact Analysis for Mission Change, Operations and Maintenance, and Training–User Manual*, Technical Report E-85/ADA022698 (CERL, February 1976); *Attribute Descriptor Package*, Technical Report E-86/ADA024303 (CERL, March 1976); S. E. Thomas, R. A. Mitchell, R. E. Riggins, J. J. Fittipaldi, and E. W. Novak, *Computer-Aided Environmental Impact Analysis for Industrial, Procurement, and Research, Development, Test, and Evaluation Activities–User Manual*, Technical Report N-43/ADA056997 (CERL, May 1978).

[5] J. van Weringh, J. Patzer, R. Welsh, and R. Webster, *Computer-Aided Environmental Legislative Data System (CELDS) User Manual*, Technical Report N-56/ADA061126 (CERL, September 1978).

[6] *The Economic Impact Forecast System–Description and User's Instructions*, DA PAM 200-2 (Department of the Army, December 1976).

Environmental considerations for each of these nine Functional Areas are classified into 13 Technical Specialties, broad categories which define and categorize environmental attributes*: Ecology, Health Science, Air Quality, Surface Water, Groundwater, Sociology, Economics, Earth Science, Land Use, Noise, Transportation, Aesthetics, and Energy and Resource Conservation. Intersections within the detailed matrix are identified with indicators of "need-to-consider" for the potential impact of an Army activity on an environmental attribute.

The Functional Areas are further broken down into basic Army activities and programs (BAAPs). These BAAPs are compared to the environmental attributes in each Technical Specialty, using a "need-to-consider" scale which indicates the probability of impact occurrence, rather than the potential magnitude of the impact. Keyed to the BAAPs are Ramification Remarks and Mitigation Statements. Ramification Remarks explain why the BAAPs were scored in the matrix as they were and typically address differing degrees of impact. The Mitigation Statements describe ways to decrease or avoid a specific impact.

The user has the option of obtaining output at *two levels:* review and detailed. The *review level* contains attributes that give an overview of the nature of potential impacts (see Figure 1). This level is used primarily to assist reviewers of completed EIAs and EISs and to aid in selecting the best environmental alternative from numerous alternative actions. The *detailed level,* which is generally used to help prepare major EISs, contains the more specific attributes of a Technical Specialty (Figure 1). *Controversial* attributes, which are presented at both levels, are attributes that are controversial in nature, whether or not the actual impact is scientifically significant.

To make the output more site-specific, the user completes an input form and answers a series of filter questions for each Technical Specialty. (The following example provides instructions for completing the current Mission Change input form.) This information is then either sent to CERL, where it is processed, or retrieved interactively by the user. (An operating agency has not been designated. CERL is providing limited usage as part of the R&D effort, until designation is complete.) Chapter 3 provides instructions for using and accessing EICS.

*Environmental variables or characteristics.

Ecology Review-Level Attributes

1. Natural Setting
2. Game Animals
3. Game Fish
4. Rare or Endangered Species
5. Increase in Undesirable Species

Ecology Detailed-Level Attributes

18. Food Webs
19. Productivity
20. Seasonal Aspect
21. Stratification
22. Successional Stage
23. Small Game Hunting
24. Waterfowl Hunting
25. Big Game Hunting
26. Bottom Life
27. Warm Water Fishing
28. Cold Water Fishing
29. Large Lake Fishing
30. Coastal Water Fishing
31. Shellfish
32. Deep-Sea Fishing
33. Disease Vectors
34. Noxious Weeds
35. Other Undesirable Species

Ecology Controversial Attributes

10.(41*) Impacts on Game Animals
11.(42*) Encroachment on Natural Habitat
11.(43*) Threatened Species

Figure 1. The EICS attribute levels.

Example

The following example has been developed so that the potential user can understand the simplicity of using EICS and determine the potential value of the output for a particular problem. The example, called "Modification of the Mission of the Sunny Point Military Ocean Terminal," addresses a real location and logical, but totally fictitious, actions. Sunny Point, which is located on the coastal plain in North Carolina, is being used as an Army shipping terminal. There currently is no active training at the site. With the help of EICS, two hypothetical alternatives will be investigated: (1) moving a small Army unit to Sunny Point for training in amphibious assaults and operations in the marshland areas, and (2) locating an Army logistics orientation school, which primarily involves classroom training, at Sunny Point.

Completion of the following steps will insure rapid access to and effective use of EICS.

a. *Obtain Essential User Manuals.* CERL points of contact are Dr. Harold Balbach or Dr. Edward Novak of the Environmental Division at Commercial (217) 352-6511 or FTS 958-7299, 7286, or 7011. Users will need the documents and user manuals to use the system effectively; they are available from National Technical Information Service. CERL or the operating agency will generally assess how extensively the EICS will be used for each project and will determine any necessary reimbursement for assistance.

b. *Specify EICS Functional Area Requirements.* After initial telephone conversations with CERL researchers and a general review of the EICS user manuals, the user will determine which Army Functional Areas (e.g., Construction, Training, Mission Change) should be accessed for his/her project. For example, in the case of the Sunny Point alternatives, the user has determined that the Mission Change Functional Area will best meet project needs.

c. *Complete EICS Functional Area Input Forms.* The EICS user manuals (CERL Technical Reports E-50, E-85, and N-43) provide instructions for completing the input forms. (The interactive procedure requests the same information in slightly different order and format; it is recommended that you use the input form to summarize your project even if your access will be entirely through the computer terminal.) For example, for the Sunny Point alternatives, the user chooses to complete two sets of Mission Change input forms from CERL TR E-85, one form for each of the alternatives (Figures 2a and 2b). The user completes the following portions of the Mission Change input forms:

1-3. The user completes the standard, self-explanatory information asked for. Note: if FTS access is possible, users should include both their commercial and FTS phone numbers. CERL cannot use Autovon.

4. The user labels the geographical site on which the activity will be performed with a number or a descriptive name.

5. This section, which contains the "BAAP Filtering Mechanism," varies slightly among Functional Areas. In the case of Mission Change, the user responds to three questions (called prefilter or program or subprogram questions) which are found in the User Manual (CERL Technical Report E-85). The first question asks if this is a realignment of military forces (Answer A) or a change in support function only (Answer B). The second question is concerned with whether this realignment will increase military strength (Answer A), decrease strength (Answer B), or generate both increases or decreases (Answer C). The third question involves changes in support functions. The user determines if this change will require: (a) more support in the form of civilian employees, housing, etc., (b) less support in the form of civilian employees, housing, etc., or (c) more support in some areas and less support in others. Answering these questions accurately will allow EICS to determine which activities involved in a mission change should be examined by the user.

6A and 6B. In 6A, the user selects the environmental Technical Specialties for which he/she desires output, and then records the total number of specialties selected in part 6B. For example, the Sunny Point user has elected to receive output only from the Ecology Technical Specialty Area of EICS. (Interactive access allows retrieval of only one Technical Specialty at a time.)

7. A user who wants an explanation of the impacts on his/her matrix and ways to mitigate those impacts may request the Ramifications and Mitigations text (Figure 3). These statements are presently available only through CERL and are not available interactively.

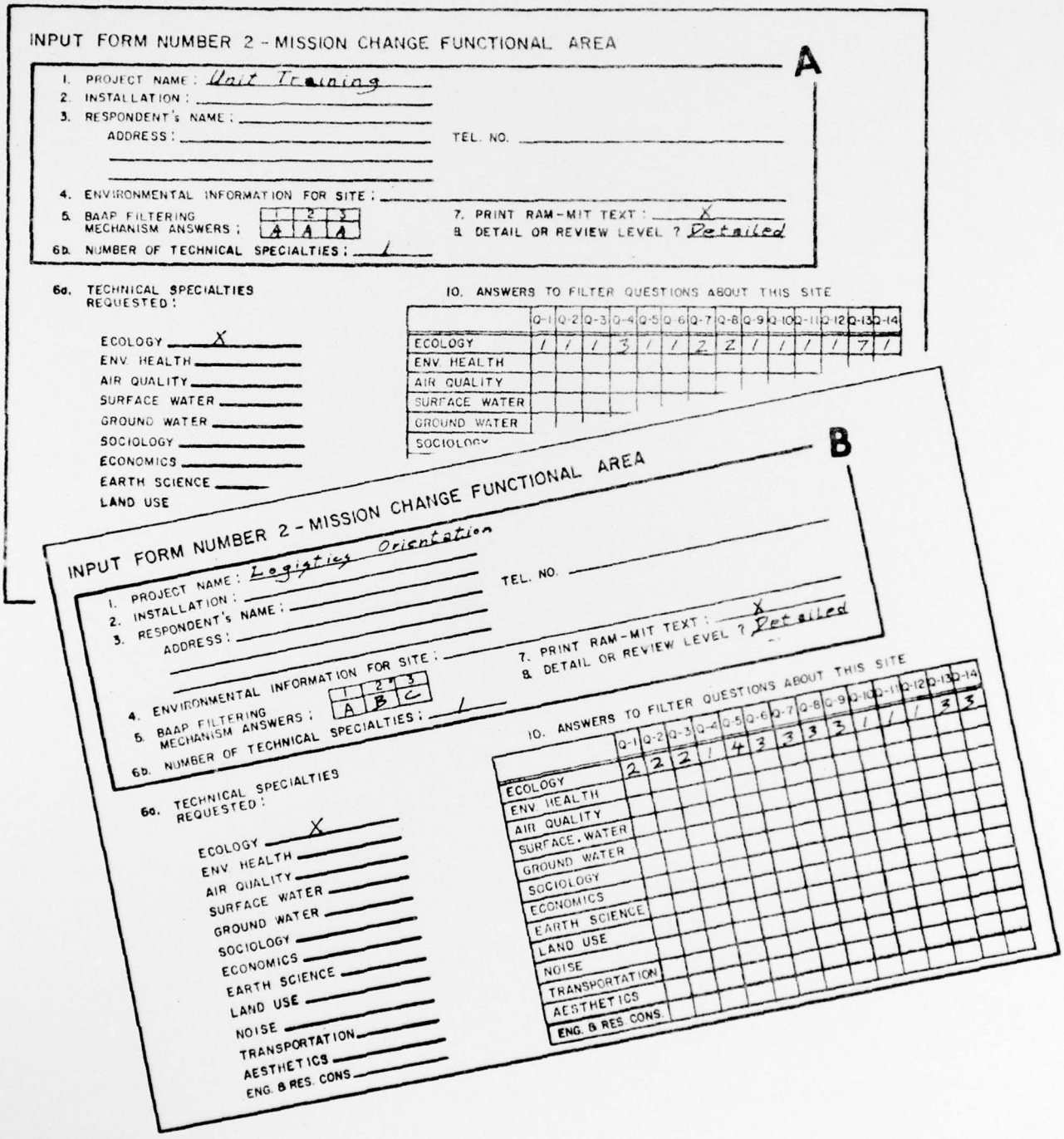
8. The user elects to review both the detailed- and the review-level matrices.

9. Not on input form at this time.

10. Since the user has selected only the Ecology Technical Specialty from which to receive output, he/she need only answer the 14 Ecology filter questions to complete the input form (Figure 4). As shown in Figures 2a and 2b, answers to the filter questions for the two alternatives are significantly different.

d. *Request Output.* EICS output may be obtained either by (1) mailing the completed input form to CERL, or (2) obtaining output via remote terminal (see Chapter 3). If a remote terminal is used, completing the input form will decrease the time required for inputting the information.

e. *Receive Output.* If the user has mailed or phoned in the answers to the filter questions, he/she will receive output from CERL by mail within 1 to 2 weeks. However, using the interactive mode will enable the user to obtain output within minutes.



a. For unit training alternative
b. For logistics orientation alternative

Figure 2. EICS input forms for the Sunny Point, NC, alternative actions.

2 1

2131

/RAMIFICATIONS/
INCREASED NUMBERS OF TROOPS OR VEHICLES IN MOVEMENT, PARTICULARLY IN RELATIVELY REMOTE AREAS, WILL INCREASE THE LIKELIHOOD OF DESTRUCTION OF HERBACEOUS AND SHRUBBY VEGETATION WHICH PROVIDES HABITAT
AND FOOD FOR NUMEROUS SMALL MAMMALS, BIRDS, AND DEER, AND WHICH INFLUENCES THE RATE AND QUALITY OF SURFACE RUNOFF. TROOP INCREASES OF 50% OR MORE ARE MOST IMPORTANT.
PROBLEMS OF SANITATION AND LITTERING WILL ALSO INCREASE.

/MITIGATIONS/
MOVEMENT SHOULD BE RESTRICTED TO DESIGNATED AND MARKED ROUTES AND AREAS. CONSIDERATION SHOULD BE GIVEN TO PERMANENT IMPROVEMENT OF HEAVILY-USED ROUTES.
PROVISIONS FOR COLLECTION OF SANITARY AND SOLID WASTE SHOULD BE INCREASED PROPORTIONATELY.

2133

/RAMIFICATIONS/
OPENING NEW AREAS TO TROOP OPERATIONS WILL CAUSE IMPACTS ON THE ECOLOGY, PARTICULARLY WHERE THE AREA CHOSEN HAS BEEN RELATIVELY UNSPOILED. SOME VEGETATION WILL ALWAYS BE DESTROYED OR DAMAGED, AFFECTING ANIMALS BY REDUCING POTENTIAL SHELTER AND FOOD SOURCES. SHY OR RARE ANIMAL SPECIES WILL TEND TO LEAVE. LARGE ANIMALS CAN MOVE OUT OF THE AREA, BUT MAY OVERPOPULATE THE TERRITORIES INTO WHICH THEY MOVE. SMALLER ANIMALS MAY RELOCATE ONLY VERY SLOWLY OR MAY DIE. IMPACTS WILL BE PROPORTIONAL TO THE NUMBERS, FREQUENCY, AND DURATION OF SUCH NEW OPERATIONS.

/MITIGATIONS/
SURVEY PROPOSED AREAS OF USAGE TO DETERMINE RELATIVE ECOLOGICAL VALUE. USE FIRST THOSE AREAS OF AVERAGE OR LOWER VALUE. NEW ROUTES SHOULD AVOID NATURAL WATER BODIES AND KNOWN HABITAT OF RARE OR ENDANGERED SPECIES.

2135

/RAMIFICATIONS/
CHANGING THE TIME OF TROOP OR VEHICLE MOVEMENT FROM DAY TO NIGHT WILL INTERRUPT NOCTURNAL ANIMALS WHICH ARE NORMALLY INACTIVE DURING THE DAY, BUT MAY HELP ANIMALS WHICH ARE ACTIVE IN DAYLIGHT. CHANGING OPERATION TIME TO A DIFFERENT SEASON CAN CAUSE NEGATIVE IMPACTS IF THE CHANGE IS TO A FLOWERING OR FRUITING SEASON FOR PLANTS WHOSE FRUITS OR SEEDS FURNISH IMPORTANT ANIMAL FOOD. OPERATIONS IN RAINY CONDITIONS HAVE INCREASED LIKELIHOOD OF VEGETATION DESTRUCTION DUE TO SOIL INSTABILITY, AND EROSION AND ITS EFFECTS WILL BE INCREASED AS WELL. OPERATIONS IN CRITICAL BREEDING OR NESTING SEASONS CAN CAUSE BIRDS AND SMALL ANIMALS TO FAIL TO MATE OR TO ABANDON THEIR NESTS OR YOUNG.

/MITIGATIONS/
CHANGES IN TIME OF DAY RESULT IN SOME UNAVOIDABLE IMPACTS. CHANGE OF SEASON SHOULD BE PLANNED TO AVOID ACTIVITIES IN THE CRITICAL PHASES OF REPRODUCTIVE CYCLES. DETERMINATION OF SUCH CRITICAL PERIODS WILL REQUIRE CONSULTATION WITH LOCAL, STATE, OR FEDERAL FORESTERS, BOTANISTS, AND WILDLIFE BIOLOGISTS. SOIL CONSERVATION SERVICE PERSONNEL CAN DETERMINE WHICH SOILS MAY BE MOST READILY ERODED IN WET SEASON OPERATIONS.

2136

/RAMIFICATIONS/
INCREASED FREQUENCY OR DURATION OF GROUND OPERATIONS ACTIVITIES WILL INCREASE ALL EFFECTS DUE TO VEGETATION DESTRUCTION: THE ACTUAL LOSS OF VEGETATION, DESTRUCTION OF FOOD AND HABITAT, AND DISTURBANCE OF SURFACE WATER PATTERNS. INCREASES OF 50% OR MORE ARE MOST IMPORTANT. PROBLEMS OF SANITATION AND LITTERING WILL ALSO INCREASE.

/MITIGATIONS/
MOVEMENT SHOULD BE RESTRICTED TO DESIGNATED AND MARKED ROUTES AND AREAS. CONSIDERATION SHOULD BE GIVEN TO PERMANENT IMPROVEMENT OF HEAVILY-USED ROUTES.
PROVISIONS FOR COLLECTION OF SANITARY AND SOLID WASTE SHOULD BE INCREASED PROPORTIONATELY.

2141

/RAMIFICATIONS/
WEAPONS WITH MUCH GREATER DESTRUCTIVE POWER WILL PRODUCE GREATER VEGETATION DESTRUCTION, WITH EFFECTS ON ANIMAL POPULATIONS DEPENDENT ON THAT VEGETATION FOR FOOD AND SHELTER. OF PARTICULAR IMPORTANCE WOULD BE INTRODUCTION OF PYROTECHNICS, ROCKETS, AND OTHER FIRE HAZARDS.

/MITIGATIONS/
IMPACTS ARE GENERALLY UNAVOIDABLE.

2143

/RAMIFICATIONS/
CONVERSION TO IMPACT AREA OR FIRING RANGE STATUS OF AREAS THAT HAVE NOT PREVIOUSLY BEEN USED FOR THAT PURPOSE WILL PRODUCE IMPACTS RANGING FROM MILD TO SEVERE. THE SEVERITY OF IMPACT WILL DEPEND ON THE PREVIOUS CONDITION OF THE AREA AND THE AMOUNTS AND KINDS OF WEAPONS USED. MOST EFFECTS WILL BE DUE TO VEGETATION (HABITAT) DESTRUCTION. SOME INCREASES IN INSECT PESTS COULD BE CREATED BY LARGE CRATERS, LEFT UNFILLED AFTER SHELLING, WHICH COLLECT STANDING WATER. NOISE EFFECTS HAVE THE POTENTIAL TO DISTURB NESTING OR BREEDING OF ANIMALS AND BIRDS, AND MAY INFLUENCE SHY OR RARE ANIMALS TO EMIGRATE. FIRE HAZARD AND EROSION EFFECTS WILL BE CONSIDERABLY GREATER.

/MITIGATIONS/
SURVEY PROPOSED IMPACT AREAS TO DETERMINE RELATIVE ECOLOGICAL VALUE. USE PREFERENTIALLY THOSE AREAS OF AVERAGE OR LOWER VALUE. AVOID USE OF AREAS CLOSE TO NATURAL WATER BODIES, KNOWN HABITAT OF RARE OR ENDANGERED SPECIES, AND AREAS WITH CRITICAL SLOPE (AVERAGE GREATER THAN 7%, MAXIMUM GREATER THAN 35% OR UNSTABLE SOILS AS DETERMINED BY SOIL CONSERVATION SERVICE PERSONNEL.

2147

/RAMIFICATIONS/
CHANGING HEAVY WEAPONS FIRING TO A RAINY SEASON WILL INCREASE EROSION POTENTIAL, AS WELL AS THE SEDIMENT LOAD IN EROSION THAT DOES OCCUR, AFFECTING AQUATIC LIFE IN WATER BODIES RECEIVING RUNOFF. CHANGING THE FIRING TO AN EXTREMELY DRY SEASON WILL INCREASE FIRE DANGER. CHANGING TIME OF FIRING TO AN ANIMAL OR BIRD BREEDING OR NESTING SEASON WILL DISTURB THE PRODUCTION OF YOUNG AND, BY DESTROYING ACTUAL OR POTENTIAL FOOD PLANTS, CAN STRAIN THE ENVIRONMENTAL ABILITY TO SUSTAIN THESE YOUNG ANIMALS.

/MITIGATIONS/
PERMANENT CHANGE OF FIRING TIMES TO WET OR DRY SEASONS WILL PRODUCE IMPACTS WHICH ARE LARGELY UNAVOIDABLE. TEMPORARY CHANGES SHOULD BE PLANNED TO AVOID SUCH SEASONS AS MUCH AS POSSIBLE. CHANGE TO WET SEASON FIRING MAY REQUIRE AVOIDANCE OF AREAS WITH CRITICAL SLOPE OR UNSTABLE SOILS AS INDICATED BY SOIL CONSERVATION SERVICE, LOCAL, STATE, OR FEDERAL FORESTERS, BOTANISTS, AND WILDLIFE BIOLOGISTS SHOULD BE CONSULTED TO DETERMINE CRITICAL REPRODUCTIVE PERIODS TO BE AVOIDED. IF INCREASED WEAPONS USAGE (BAAP 145) RESULTS IN INCREASED FREQUENCY OR DURATION OF FIRING, IMPACTS WILL BE EQUIVALENT.

2148

/RAMIFICATIONS/
INCREASED FREQUENCY OR DURATION OF GROUND OPERATIONS ACTIVITIES WILL INCREASE ALL EFFECTS DUE TO VEGETATION DESTRUCTION: THE ACTUAL LOSS OF VEGETATION, DESTRUCTION OF FOOD AND HABITAT, AND DISTURBANCE OF SURFACE WATER PATTERNS. INCREASES OF 50% OR MORE ARE MOST IMPORTANT.

/MITIGATIONS/
SOME DEGREE OF IMPACT IS GENERALLY UNAVOIDABLE.

Figure 3. Ramification and mitigation remarks for ecology/mission change functional area matrices.

2151

/RAMIFICATIONS/
INCREASE IN THE STORAGE OR TRANSPORT OF HAZARDOUS WEAPONRY OR MATERIALS WILL INCREASE THE CHANCE THAT SOME ACCIDENTAL EXPLOSION WILL OCCUR. IF A FIRE RESULTED FROM THE EXPLOSION, THERE WOULD BE ENVIRONMENTAL CONSEQUENCES.

/MITIGATIONS/
RISK OF ACCIDENTS MAY BE REDUCED BY USING SAFETY PRECAUTIONS AND TRAINED DRIVERS AND BY DEVELOPING EXPLOSION/FIRE CONTINGENCY PLANS.

2161

/RAMIFICATIONS/
MORE DESTRUCTIVE VEHICLES WHICH WOULD BE USED IN CROSS-COUNTRY MOVEMENTS CAN BE EXPECTED TO DESTROY MORE HERBACEOUS AND SHRUBBY VEGETATION AND TO INCREASE THE LIKELIHOOD OF DAMAGE TO TREES, ESPECIALLY SAPLINGS, EITHER DIRECTLY OR BY COMPACTING SOIL AROUND ROOT SYSTEMS OF TREES ALONG REGULARLY-USED ROUTES. BOTH VEGETATION DESTRUCTION AND SOIL COMPACTION WILL INCREASE SURFACE WATER RUNOFF RATES, PROMOTING EROSION AND/OR CHANGING THE PATTERNS OF SUCH DRAINAGE. VEGETATION DISTANT FROM THE ACTUAL SITE COULD THUS BE AFFECTED. NOXIOUS WEEDS MAY BE INTRODUCED OR MAY INCREASE ON NEWLY DISTURBED SOIL.

/MITIGATIONS/
CROSS-COUNTRY MOVEMENT SHOULD BE RESTRICTED TO THE MINIMUM NECESSARY FOR TRAINING. CONSIDERATION SHOULD BE GIVEN TO PERMANENT IMPROVEMENT OF HEAVILY-USED ROUTES. IN PARTICULAR, STREAM CROSSINGS SHOULD BE HARD-SURFACED.

2163

/RAMIFICATIONS/
INTRODUCTION OF VEHICLE OPERATIONS TO NEW AREAS WILL PROVIDE OPPORTUNITY FOR MODERATE TO SEVERE DESTRUCTION OF HERBACEOUS AND SHRUBBY VEGETATION WHERE SUCH OPERATIONS ARE NOT LIMITED TO PREVIOUSLY ESTABLISHED ROADWAYS. LARGER TREES MAY BE DAMAGED, REDUCING FOREST COMPLEXITY AND IN SOME CASES RESULTING IN LONG-TERM CHANGES IN FOREST STRUCTURE. REDUCTION OF ANIMAL HABITATS AND FOOD SOURCES MAY BE EXPECTED IN A SIGNIFICANT NUMBER OF INSTANCES. NOXIOUS WEEDS MAY PROLIFERATE IN DISTURBED AREAS. SHY AND RARE ANIMALS WILL BE ENCOURAGED TO EMIGRATE BOTH BY CHANGES IN THEIR HABITATS AND ALSO BY THE MERE PRESENCE OF MEN AND VEHICLES.

/MITIGATIONS/
SURVEY PROPOSED AREAS OF USAGE TO DETERMINE RELATIVE ECOLOGICAL VALUE. USE FIRST THOSE AREAS OF AVERAGE OR LOWER VALUE. NEW ROUTES SHOULD AVOID NATURAL WATER BODIES, KNOWN HABITAT OF RARE OR ENDANGERED SPECIES, AND AREAS WITH CRITICAL SLOPE (AVERAGE GREATER THAN 10%, MAXIMUM GREATER THAN 35%) OR UNSTABLE SOILS AS DETERMINED BY THE SOIL CONSERVATION SERVICE. UNAVOIDABLE WATER CROSSINGS SHOULD BE PERMANENTLY IMPROVED.

2171

/RAMIFICATIONS/
ADDITION OF FIXED-WINGED AIRCRAFT MAY AFFECT BIRDS IF THE FLIGHTS ARE LOW-LEVEL AND OCCUR OFTEN ENOUGH TO CAUSE MAJOR NOISE DISTURBANCE TO ANIMALS AND BIRDS IN BREEDING OR NESTING GROUNDS. EFFECTS WOULD BE DUE TO ABANDONMENT OF NESTS OR YOUNG, OR TO BREEDING FAILURE.

/MITIGATIONS/
SUCH EFFECTS ALONG FLIGHT PATHS NEAR AIRFIELDS ARE UNAVOIDABLE.

2173

/RAMIFICATIONS/
ADDITION OF ROTARY-WINGED AIRCRAFT WILL CAUSE DISTURBANCE TO NESTING OR BREEDING BIRDS IN AREAS WHERE LOW-LEVEL FLIGHTS ARE CONDUCTED. IN THIS REGARD ROTARY-WINGED AIRCRAFT ARE MUCH MORE LIKELY TO CAUSE DISTURBANCE THAN FIXED-WINGED AIRCRAFT SINCE ROTARY-WINGED CRAFT ARE MORE LIKELY TO BE USED AT LOW ALTITUDES. EFFECTS WOULD BE DUE TO ABANDONMENT OF NESTS OR YOUNG, OR TO BREEDING FAILURE.

/MITIGATIONS/
SUCH EFFECTS ALONG FLIGHT PATHS NEAR AIRFIELDS ARE UNAVOIDABLE. INTENSIVE LOW-LEVEL OPERATIONS SHOULD BE SHIFTED FROM AREAS OF HIGH POTENTIAL REPRODUCTIVE DISTURBANCE AS DETERMINED BY WILDLIFE BIOLOGISTS. STATE AND FEDERAL WILDLIFE REFUGES MUST BE CLEARLY MARKED ON OPERATIONAL FLIGHT CHARTS.

2177

/RAMIFICATIONS/
INCREASING OPERATIONAL AIRSPACE WILL EXTEND THE EFFECTS EFFECTED FROM THE PARTICULAR TYPE OF CRAFT (2A&PS 171, 173) TO THE NEW AREA IN WHICH OPERATIONS OCCUR. THE PRIMARY IMPACTS WILL BE IN THE REPRODUCTIVE DISTURBANCE OF POPULATIONS OF NESTING OR BREEDING BIRDS. NOISE EFFECTS ON LARGE AND SMALL GAME WILL BE MINIMAL OUTSIDE OF MAJOR TRAINING EXERCISES; THEY WOULD BE CONTROVERSIAL EFFECTS IF THE AREA CONTAINED RARE OR ENDANGERED SPECIES WHICH MIGHT BE DISTURBED.

/MITIGATIONS/
SURVEY PROPOSED AREAS TO DETERMINE ECOLOGICAL VALUE, PARTICULARLY IN RESPECT TO BREEDING OR NESTING ANIMAL AND BIRD POPULATIONS. USE FIRST THOSE AREAS OF AVERAGE OR LOWER VALUE. AVOID AREAS WHICH SERVE AS SPECIFIC BREEDING OR NESTING GROUNDS, AND AREAS KNOWN TO CONTAIN RARE OR ENDANGERED BIRD SPECIES. STATE AND FEDERAL WILDLIFE REFUGES MUST BE CLEARLY MARKED ON OPERATIONAL FLIGHT CHARTS.

2179

/RAMIFICATIONS/
INCREASING THE NUMBERS, FREQUENCY, OR DURATION OF FLIGHTS WILL HAVE MINIMAL EFFECTS ON ANIMAL POPULATIONS UNLESS INCREASE OF OVER 50% ARE MADE, ESPECIALLY IN LOW-LEVEL OPERATIONS. IMPACTS ON ANIMALS, THE MOST IMPORTANT OF WHICH WOULD BE REPRODUCTIVE DISTURBANCE, WOULD PRINCIPALLY BE DUE TO NOISE POLLUTION.

/MITIGATIONS/
SUCH EFFECTS ALONG FLIGHT PATHS NEAR AIRFIELDS ARE UNAVOIDABLE. INTENSIVE LOW-LEVEL OPERATIONS SHOULD BE SHIFTED FROM AREAS OF HIGH POTENTIAL REPRODUCTIVE DISTURBANCE AS DETERMINED BY WILDLIFE BIOLOGISTS. STATE AND FEDERAL WILDLIFE REFUGES MUST BE CLEARLY MARKED ON OPERATIONAL FLIGHT CHARTS.

2181

/RAMIFICATIONS/
CHANGING TIME OF OPERATIONS TO A BREEDING OR NESTING SEASON WILL TEND TO IMPACT BIRDS AND SMALL ANIMALS DURING LOW-LEVEL OPERATIONS. RARE OR ENDANGERED BIRDS MAY LEAVE THE AREA. PRIMARY EFFECTS ARE CAUSED BY NOISE POLLUTION WHICH CAN CAUSE FAILURE TO MATE OR ABANDONMENT OF NESTS OR YOUNG.

/MITIGATIONS/
SUCH EFFECTS ALONG FLIGHT PATHS NEAR AIRFIELDS ARE UNAVOIDABLE. LOCATION OF INTENSIVE LOW-LEVEL OPERATIONS SHOULD BE SHIFTED DURING TIMES OF HIGH POTENTIAL REPRODUCTIVE DISTURBANCE AS DETERMINED BY BIOLOGISTS. KNOWN HABITAT OF RARE OR ENDANGERED BIRDS SHOULD BE AVOIDED. STATE AND FEDERAL WILDLIFE REFUGES MUST BE CLEARLY MARKED ON OPERATIONAL FLIGHT CHARTS.

2193

/RAMIFICATIONS/
ADDITION OF AIRBORNE-AIRMOBILE OPERATIONS WILL CREATE IMPACTS RESULTING FROM THE AIRCRAFT USED AND FROM THE INTRODUCTION OF LARGE NUMBERS OF MEN AND MATERIALS TO A VERY LOCALIZED AREA. LOW-LEVEL FLYING MEANS THAT NOISE EFFECTS MAY BE ACTING ON BIRDS AND ON LARGE AND SMALL GAME. SHORT-TERM USAGE OF SMALL LANDING AREAS MAY DAMAGE SOME VEGETATION OR DISTURB SOME SMALLER, NONMOBILE ANIMALS. BOTH EFFECTS ON THE ANIMAL POPULATIONS WOULD BE TEMPORARY EXCEPT IN THE CASE OF CONTINUOUS USAGE OF A LANDING OR DROP FIELD.

/MITIGATIONS/
SURVEY PROPOSED DROP ZONES TO DETERMINE RELATIVE ECOLOGICAL VALUE. USE 1ST THOSE AREAS OF AVERAGE OR LOWER VALUE. AVOID KNOWN HABITAT OF ENDANGERED SPECIES, AND AREAS WITH UNSTABLE SOILS AS DETERMINED BY THE SOIL CONSERVATION SERVICE. STATE AND FEDERAL WILDLIFE REFUGES MUST BE CLEARLY MARKED ON OPERATIONAL FLIGHT CHARTS. NOISE EFFECTS NEAR THE LANDING OR DROP ZONE ARE UNAVOIDABLE.

Figure 3. (cont'd).

2244
/RAMIFICATIONS/
INCREASED LOADS ON SEWAGE SYSTEMS THAT DO NOT PRESENTLY HAVE TERTIARY TREATMENT WILL INCREASE THE LIKELIHOOD OR SEVERITY OF CONTAMINATION OF GROUND OR SURFACE WATER, STREAMS, OR LAKES, WITH RESULTING DISTURBANCE TO AQUATIC ECOSYSTEMS. INCREASED LOADS ON ALL TYPES OF SEWAGE SYSTEMS WILL INCREASE CHANCES OF NUTRITIONAL IMBALANCE IN RECEIVING WATER BODIES, WITH RESULTANT EUTROPHICATION, ALGAL BLOOMS, ETC.

/MITIGATIONS/
IMPACTS OF CONTAMINATION WILL BE UNAVOIDABLE WHERE PRESENT TREATMENT IS NOT TERTIARY. CONVERSION TO TERTIARY TREATMENT MAY BE NECESSARY AND IS HIGHLY RECOMMENDED WHERE INCREASED LOAD REQUIRES INCREASING THE CAPACITY OF A PRESENT PRIMARY OR SECONDARY SYSTEM. IMPACTS OF NUTRITIONAL IMBALANCE ARE UNAVOIDABLE WITH ALL TREATMENT SYSTEMS IN WHICH DISCHARGE INTO NATURAL WATER BODIES OCCURS.

2245
/RAMIFICATIONS/
INCREASED VOLUMES OF REFUSE TO BE DISPOSED OF IN DUMPS OR LANDFILLS WILL INCREASE THE INCIDENCE OF ANIMAL PESTS ATTRACTED TO REFUSE, SUCH AS RATS, MICE, RACCOONS, SKUNKS, BEARS, SNAKES, AND INSECTS, AS WELL AS UNDESIRABLE WEEDS WHICH THRIVE ON DISTURBED SOIL.

/MITIGATIONS/
ANY INCREASE IN REFUSE LOAD SHOULD BE HANDLED BY APPROVED SANITARY LANDFILL. COVERED FILL SHOULD BE PLANTED WITH NATIVE GRASSES WITHIN 7 DAYS IN SPRING OR SUMMER AND WITHIN 3 WEEKS IN AUTUMN OR WINTER.

2256
/RAMIFICATIONS/
DECREASE IN REFUSE DISPOSAL WILL HAVE A NEGATIVE EFFECT ON THOSE ANIMALS WHICH FIND SHELTER AND FOOD AVAILABLE IN DUMPS OR NEAR LANDFILLS, SUCH AS RODENTS, RACCOONS, SKUNKS, BEARS, AND SNAKES, ALTHOUGH THESE ANIMALS ARE OFTEN CONSIDERED PESTS BY MAN, THEY ARE ALSO PART OF FOOD WEBS IN NATURE.

/MITIGATIONS/
IMPACTS RESULTING FROM REDUCED REFUSE DISPOSAL ARE UNAVOIDABLE, IN TERMS OF HUMAN VALUES, MOST OF THESE IMPACTS ARE POSITIVE.

2291
/RAMIFICATIONS/
CONSTRUCTION OF NEW FACILITIES WILL PRODUCE THOSE PROBLEMS REVIEWED UNDER THE CONSTRUCTION FUNCTIONAL AREA. THESE INCLUDE SUCH ITEMS AS TEMPORARY INCREASED EROSION POTENTIAL, INCREASED SEDIMENT LOAD IN NEARBY STREAMS OR LAKES, AND AQUATIC DISTURBANCE (DUE TO DISTURBANCE OF SURFACE DRAINAGE PATTERNS), REMOVAL OF VEGETATION AND ACCOMPANYING DESTRUCTION OF WILDLIFE HABITAT, CREATION OF EDGE EFFECTS (GREATER WIND AND SUNLIGHT) ALONG AREAS AT THE EDGE OF CLEARINGS, ENCROACHMENT ON TERRITORY OF RARE OR ENDANGERED SPECIES, INTRODUCTION OF WEEDS, AND INCREASE IN ANIMAL PESTS. THESE IMPACTS ARE LESS LIKELY OR OF LESSER IMPORTANCE IN MANY CASES WHERE SUCH CONSTRUCTION IS TO OCCUR IN ALREADY-DISTURBED AREAS.

/MITIGATIONS/
MITIGATIONS FOR PARTICULAR CONSTRUCTION ACTIVITIES CAN BE FOUND UNDER THE CONSTRUCTION FUNCTIONAL AREA. CONSTRUCTION SHOULD BE RESTRICTED IF POSSIBLE TO AREAS WHICH HAVE ALREADY BEEN DISTURBED. PREVIOUSLY UNDISTURBED AREAS SHOULD BE SURVEYED TO DETERMINE RELATIVE ECOLOGICAL VALUE; USE FIRST THOSE AREAS OF AVERAGE OR LOWER VALUE.

2292
/RAMIFICATIONS/
DEMOLITION OF FACILITIES MAY RESULT IN A FEW TEMPORARY EFFECTS SUCH AS UNSIGHTLY DEBRIS, INCREASED SEDIMENT LOADS IN NEARBY STREAMS DUE TO EROSION EFFECTS, AND INTRODUCTION OF OR INCREASE IN WEEDY PLANTS OR ANIMAL PESTS.

/MITIGATIONS/
DEBRIS SHOULD BE CLEARED AS IT ACCUMULATES, AND DISTURBED SOIL REPLANTED WITH GROUND COVER WITHIN 7 DAYS EVEN IF ALL WORK HAS NOT BEEN COMPLETED. DISTURBED AREAS ADJACENT TO WATER BODIES SHOULD UTILIZE SEDIMENT CONTROL MEASURES DURING DEMOLITION.

Figure 3. (cont'd).

1. Do any changes in military function involve changes in field training as opposed to classroom training?

(1) Yes

(2) No

2. Does this mission change involve any new construction?

(1) Yes

(2) No

3. Will any areas be used that have not previously been employed for training or support activities?

(1) Yes

(2) No

4. Which of the following statements best describes any areas which have previously been used for training or support activities and in which the intensity of these activities will increase?

(1) Extensively modified by construction, grading, paving, landscaping, etc.

(2) Regularly used by men, vehicles, and/or weaponry for field training for more than 20 days per year during at least two of the last five years.

(3) Infrequently and lightly used by men, vehicles, and/or weaponry for field training. Average usage for each of the last 10 years has been 10 days or less.

(4) No increase.

5. Measuring distances downstream or downslope, how far are any newly used areas, or any existing areas in which intensity of field activities or support use will increase, from the nearest perennial stream or permanent, year-round lake, pond, or freshwater marsh with permanent open water? (If more than one area is involved, choose the shortest measured distance from any area.)

(1) Less than 300 meters (about 100 ft)

(2) 300 to 1000 meters (about 6/10 mile)

(3) Greater than 1000 meters

(4) No new areas and no increase

6. Measuring distances downstream or downslope, is any newly used area, or any area having increased field activity or support use less than 2500 meters (about 1.5 miles) from the nearest year-round stream, pond, or small lake?

(1) Yes

(2) No

(3) No new areas and no increase

7. Measuring distances downstream or downslope, is any newly used area, or increased field activity or support use less than 8000 meters (about 5 miles) from any body of water known to support trout or salmon at any time of the year?

(1) Yes

(2) No

(3) No new areas and no increase

8. Measuring distances downstream or downslope, is any newly used area, or any area having increased field activity or support use less than 8000 meters (about 5 miles) from a large, deep freshwater lake having a surface area of more than 50 sq km (about 12,000 acres) and a depth of more than 50 meters (about 160 ft)?

(1) Yes

(2) No

(3) No new areas and no increase

9. Measuring distances downstream or downslope, is any newly used area, or any area having increased field activity or support use less than 8000 meters (about 5 miles) from any ocean beach, estuary, salt marsh, or tidal flat?

(1) Yes

(2) No

(3) No new areas and no increase

10. Is hunting upland game (birds and small mammals) permitted by law at any time in any area which touches the installation's perimeter or is hunting for these species permitted anywhere on the installation?

(1) Yes

(2) No

11. Is hunting big game (deer, bear, elk, etc.) permitted by law in any area within 2500 meters (about 1.5 miles) of the installation's perimeter, or is hunting for these species allowed anywhere on the installation?

(1) Yes

(2) No

Figure 4. Ecology filter questions for the mission change functional area of EICS.

12. Are migratory waterfowl (ducks and geese) hunted in any area within 2500 meters (about 1.5 miles) of the installation's perimeter, or may they be hunted at any time on the installation, or are they known to congregate in groups of more than one dozen at any time of year within the area described here?

(1) Yes

(2) No

13. Which of the following responses best characterizes any area in which activities associated with mission change may take place, and which has not previously been used for training or support activities?

(1) Tundra-type grasses, sedges, mosses, and dwarf shrubs

(2) Sparse but relatively undisturbed desert-type shrubs and grasses

(3) Ground cover or mostly lawn grasses, mowed several times per year, or a majority of area occupied by buildings, or area is presently paved or graveled

(4) Ground cover mostly of tall grasses or weeds

(5) Frequent but scattered shrubs or small trees (less than 10 cm or 4 in. in diameter)

(6) Continuous cover of shrubs or of larger trees (more than 10 cm or 4 in.)

(7) Most typical plants are marsh grasses, reeds, cattails, etc.

(8) Relatively recently farmed, grazed, or otherwise disturbed, having more than 25 percent bare soil

(9) No new areas

14. How far is any newly or occupied area from regularly used buildings, bivouac areas, maintenance yards, firing points, airfields, drop zones, etc.? (If more than one area is involved, choose the shortest measured distance from any area.)

(1) Less than 1000 meters (about 6/10 mile)

(2) More than 1000 meters

(3) No new areas

Figure 4. (cont'd).

For example, the Sunny Point user receives the impact matrices shown in Figures 5 and 6. The Sunny Point logistics orientation review level matrix is used as the example in Chapter 3. These matrices have decoded lists of basic Army activities on the vertical axis and environmental attributes (in this case, from the Ecology Technical Specialty) on the horizontal axis. The numbers in the right-hand column of the matrix relate directly to the numbers in the Ramifications and Mitigations text shown in Figure 4. In this example, we have separated the Review-Level outputs (Figure 5) from the Detailed-Level outputs (Figure 5) to show the striking difference between them. A matrix has also been included (Figures 5a and 5b) for which no filter questions were answered. Note that the unfiltered matrices (Figures 5a and 6a) differ in many ways from the filtered matrices in presenting impacts needing consideration. The projected environmental impact of unit training on the ecology of Sunny Point (Figures 5b and 6b) is far more severe than that of the logistics orientation training (Figures 5c and 6c). Also, the Review-Level matrices in Figure 5 are much more general and brief than the detailed matrices in Figure 6. This level of output is primarily designed for reviewing EISs and for rapidly determining the best environmental alternatives.

The key to efficient matrix analysis is developing a systematic means of focusing on the primary impacting activities and the most often impacted attributes (and associated problems) as quickly as possible; the user should not analyze every intersection in detail. The first step in a preliminary analysis is always to confirm the existence of the impacting activities and the environmental attributes for the site being studied. Chapter 4 of CERL Technical Report N-43 contains instructions for matrix analysis and application of EICS analyses to the environmental assessment process. These instructions supersede those of CERL Technical Report E-50.

f. *Environmental Impact/Problem Confirmation and Measurement.* Once the impacts are initially identified, they must be confirmed and explained in as specific and/or quantitative terms as possible. Therefore, the user may need to acquire installation-specific information by performing field surveys and preparing scopes of work for architect/engineer consulting firms. When the major potential impacts are identified, the user can employ EIFS and CELDS when appropriate.

g. *EIA/EIS Preparation.* Once the environmental impact analysis and information acquisition is complete, the user is ready to prepare an EIA or EIS.

FUNCTIONAL AREA: mission change

TECHNICAL SPECIALTY: ecology

ATTRIBUTES

1 natural setting
2 game animals
3 game fish
4 rare or endangered species
5 increase in undesirable species
• 10 impacts on game animals
• 11 encroachment on natural habitats
• 12 threatened species

• preceeded attributes are CONTROVERSIAL

MATRIX

attributes

		1	2	3	4	5	10	11	12		
b	131	C				C	B	B		2131	r
a	133	A	A	B	A	B	A	B	A	2133	a
a	135	C	A			B	B	B	A	2135	m
p	136	C				C	C	B	C	2136	s
s	141	B				C	B			2141	/
	143	A	A	B	A	B	A	A	A	2143	m
	147	C	A	C			A		A	2147	i
	148					C			C	2148	t
	151	C	C	C	C	C	C	C	C	2151	s
	161	B	B	C		B	B	B		2161	
	163	A	A	B	A	A	A	B	A	2163	
	165	C				C	B	B		2131	
	167	B	A	C		B	B	B	A	2135	
	168					C	C	B		2136	
	171	B			C		C		B	2171	
	173	B	A		C		B		A	2173	
	177	A	B		B		B		B	2177	
	179	B	B		B		B	B	B	2179	
	182		C				B		A	2182	
	183	B					C		C	2179	
	193		B		C		C		C	2193	
	244	B		A	B	A	C	B	C	2244	
	245	B	C		C	A	C	B	C	2245	
	255	C								2255	
	291	A	C	C		C	C	A	C	2291	
	292	C						C		2292	

a. Unmodified matrix (for comparative purposes).

MATRIX

attributes

		1	2	3	4	5	10	11	12		
b	131	C		C	C	C	B	B	C	2131	r
a	133	B	C	B	C	C	B	C	C	2133	a
a	135	C	A	C		B	B	B	A	2135	m
p	136	B		C	B	B	C	A	B	2136	s
s	141	B		C		C	B	B		2141	/
	145			C	C			B	C	2145	m
	147	C	A	B			A		A	2147	i
	148	B		C	C	C		B	C	2148	t
	151	C	C	C	C	C	C	C	C	2151	s
	161	B	B	B	C	B	B	B	C	2161	
	163	B	C	B	C	C	B	C	C	2163	
	165	C			C	C	B	B	C	2131	
	167	B	A	B		B	B	B	A	2135	
	168	B		C	B	C	C	A	B	2136	
	171	B			C		C		B	2171	
	173	B	A		C		B		A	2173	
	177	B	C		C		C		C	2177	
	179	B	B		B		B	B	B	2179	
	182		C				B		A	2182	
	183	B			B		C		B	2179	
	193		B		C		C	B	C	2193	
	244	B		A	B	A	C	B	C	2244	
	245	B	C		C	A	C	B	C	2245	
	291	A	C	B	B	B	C	A	B	2291	

b. Unit training alternative matrix.

MATRIX

attributes

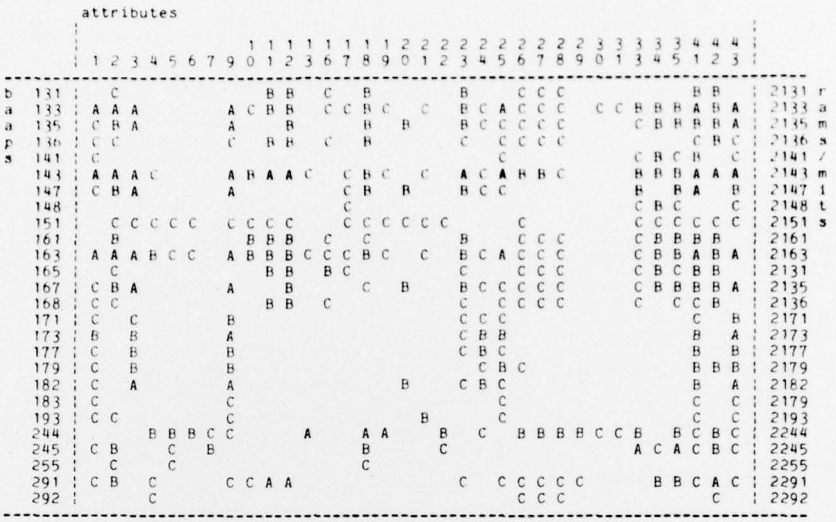
		1	2	3	4	5	11	12		
	244	C		A	B	C	B	C	2244	
	245	C	C		C	C	B	C	2245	
	255	C							2255	
	292	C				C			2292	

c. Logistics orientation alternative matrix.

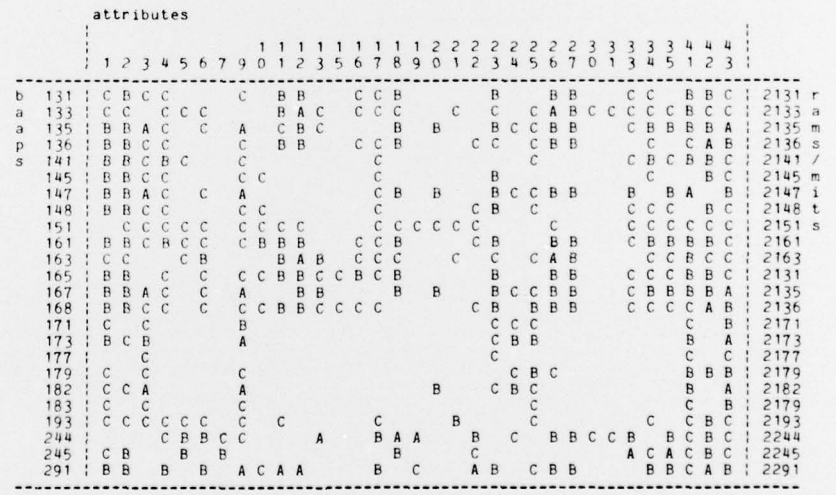
ACTIVITIES

131 increase number of troops in movement
133 conduct troop operations in new areas
135 change time of troop movement
136 incr freq/duration of troop movement
141 change to more destructive weapons
143 change to new impact area or firing range
147 change time of firing
148 increase frequency/duration of firing
151 incr stor/trans of hazardous weapons/mat
161 change to more destructive vehicles
163 operate vehicles in new areas
165 increase number of vehicles
167 change time of vehicle operations
168 incr freq/duration of vehicle operation
171 add fixed-winged aircraft
173 add rotary-wing aircraft
177 increase operational air space
179 increase number of flights
182 change time of flights
183 increase frequency/duration of flights
193 add airborne/airmobile operations
244 increase sewer usage
245 increase refuse disposal usage
255 decrease refuse disposal usage
291 construct new facilities
292 demolish facilities

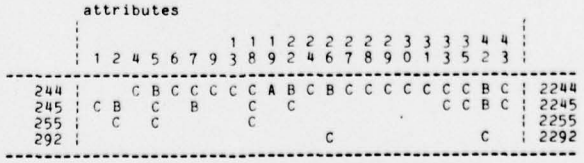
Figure 5. EICS review-level matrices.



a. Unmodified matrix (for comparative purposes).



b. Unit training alternative matrix.



c. Logistics orientation alternative matrix.

Figure 6. EICS detailed-level matrices.

FUNCTIONAL AREA: mission change

TECHNICAL SPECIALTY: ecology

ATTRIBUTES

1	large mammals	2	small mammals
3	birds	4	fish
5	reptiles	6	amphibians
7	insects	9	endangered animal species
10	trees	11	shrubs
12	herbs	13	algae
15	lichens	16	other plant species
17	endangered plant species	18	food webs
19	productivity	20	seasonal aspect
21	stratification	22	successional stage
23	small game hunting	24	waterfowl hunting
25	big game hunting	26	bottom life
27	warm water fishing	30	coastal water fishing
31	shellfish	33	disease vectors
34	noxious weeds	35	other undesirable species
* 41	impacts on game animals	* 42	encroachment on natural habitats
* 43	threatened species		

* preceeded attributes are CONTROVERSIAL

ACTIVITIES

131	increase number of troops in movement	133	conduct troop operations in new areas
135	change time of troop movement	136	incr freq/duration of troop movement
141	change to more destructive weapons	145	increase number of weapons fired
147	change time of firing	148	increase frequency/duration of firing
151	incr stor/trans of hazardous weapons/mat	161	change to more destructive vehicles
163	operate vehicles in new areas	165	increase number of vehicles
167	change time of vehicle operations	168	incr freq/duration of vehicle operation
171	add fixed-winged aircraft	173	add rotary-wing aircraft
177	increase operational air space	179	increase number of flights
182	change time of flights	183	increase frequency/duration of flights
193	add airborne/airmobile operations	244	increase sewer usage
245	increase refuse disposal usage	291	construct new facilities

d. Decoded list of ecology attributes and mission change activities matrix.

Figure 6. (cont'd).

CERL Technical Report N-43 and DA Pamphlet 200-1[7] address the process of responding to AR 200-1[8] and the original Council on Environmental Quality (CEQ) requirements for document preparation.[9]

Recently issued CEQ regulations[10] on implementing NEPA indicate some modifications to the EIS content suggested by earlier guidelines. Some of these modifications are simply a matter of re-ordering or re-emphasizing topics that preparers were previously required to address in EISs.

Other topics of consideration are more substantial. Since these additions are not addressed in CERL Technical Report N-43 and DA PAM 200-1, users must be sure not to overlook them when preparing an EIS. All such changes will be addressed in future issues of AR 200-1 and DA PAM 200-1, and in future EICS documentation. In the interim, CERL or your MACOM can provide guidance.

3 USER INSTRUCTIONS FOR INTERACTIVE EICS

If a user decides to access EICS after interactively entering ETIS, he/she need only transfer into the EICS program. The following paragraphs provide instructions for accessing ETIS (EICS, EIFS, and CELDS) information by remote terminal.

Once the user has acquired a log-in and a password from CERL's Environmental Division, he/she can access ETIS by remote terminal by following the directions in CERL Technical Reports E-78[11] and N-2[12] (DA Pamphlet 200-2),[13] and N-43.[14] After acquiring a remote terminal and a telephone, the user should dial the system's number (217/333-1587, FTS 957-1587). If there is no answer, the entire system is down for maintenance. Upon hearing a steady tone, plug the phone into the terminal, making sure that the earpiece and the speaker are in the proper openings, and log into the system. After logging in with the correct name and password, the user will receive system messages. If the system indicates "NO DIRECTORY" or a similar designation, access to the ETIS is probably closed down and the user should try again later. If the system is in operation, output similar to that shown in Figure 7 will appear on the screen or terminal. (The text on the right-hand side of the figure is explanatory and is not part of the output.)

The user should keep several things in mind when using the system. The symbol <CR> used in some instructions means to depress the carriage return button. The instruction to type CTRL-d, means to simultaneously depress the button marked CTRL and the letter d. An input error can be corrected by typing CTRL-h (hitting the CTRL and h buttons simultaneously) if the return button has not yet been depressed. This procedure will back the carriage up one space each time it is repeated. This can be done as many times as necessary. Every symbol which has been backspaced over has been removed from the terminal memory. Therefore, if the first digit of a six-digit number has been mistyped, the user must depress CTRL-h six times and then retype all six digits. The corrected symbols will be overprinted on the paper. To stop a long listing, depress the button marked DEL (delete).

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[7] *Handbook for Environmental Impact Analysis*, DA PAM 200-1 (Department of the Army, April 1975).

[8] *Environmental Protection and Enhancement*, AR 200-1 (Department of the Army, 7 December 1973).

[9] Council on Environmental Quality, "Preparation of Environmental Impact Statements: Guidelines," *Federal Register*, Vol 38, No. 147, Part II (August 1, 1973), pp 20550-20562.

[10] "NEPA: Implementation of Procedural Provisions; Final Regulations," *Federal Register*, Vol 43, No. 230 (November 29, 1978), pp 55978-56007.

[11] J. van Weringh, J. Patzer, R. Welsh, and R. Webster, *Computer-Aided Environmental Legislative Data System (CELDS) User Manual*, Technical Report N-56/ADA061126 (CERL, September 1978).

[12] R. D. Webster, R. A. Mitchell, R. L. Welsh, E. Shannon, and M. L. Anderson, *The Economic Impact Forecast System—Description and User Instructions*, Technical Report N-2/ADA027139 (CERL, June 1976).

[13] *The Economic Impact Forecast System—Description and User's Instructions*, DA PAM 200-2 (Department of the Army, December 1976).

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GENERAL ACCESS TO THE ENVIRONMENTAL TECHNICAL INFORMATION SYSTEM (ETIS)

CSO Network Unix System
Login: novak
Password:
Last login Wed May 31 08:04:06 1978
% ETIS

The user gets a dial tone and logs in; in this case, the log-in is "Novak." He/she types in the password which will not appear on the printed page.

The system responds by saying when the last log-in was and enters a percent sign. The user now enters the letters "ETIS", and the system responds by saying "What Program?" The user then asks the system to list the programs by pressing the carriage return (CR) key without entering any characters.

Welcome to CERL's
Environmental Technical Information System

What program? (Type <cr> to see list)

Type:

1 or intro for introduction to Environmental Technical Information System
2 or eics for the Environmental Impact Computer System
3 or eics for the Computer-Aided Environmental Legislative Data System
4 or eifs for the Economic Impact Forecast System
5 or aimod for the Air Model
6 or chis for the Clearinghouse Information System
7 or afeics for the Air Force Environmental Impact Computer System
8 or blis for the Baseline Information System
! mail to see your mail
crtl-d or bye to exit

The computer responds with a line of available subprograms under ETIS.

ACCESS TO EICS

What program? (Type <cr> to see list) 2

The user chooses to run EICS to retrieve the Review Level logistics orientation matrix. Therefore the user types "2". ("EICS" could also have been typed.)

Welcome to EICS

The user chooses to run EICS. Therefore, the user types "2". ("EICS" could also have been typed.)

Functional area (type CR to see list):
1 – construction
2 – mission change
3 – operation, maintenance, and repair
4 – training
5 – industrial
6 – procurement
7 – research, development, testing, and evaluation
8 – real estate

The user wishes to see the list of Functional Areas available in EICS; therefore, he/she depressed the carriage return. The system responds by listing the Functional Areas available.

Figure 7. Example EICS instructions and explanation.

functional area (type - to leave the program): 2	Since the user is interested in a mission change at Sunny Point, the key number 2 is depressed.
functional area chosen: mission change	The computer responds by indicating which Functional Area was chosen; in this case, Mission Change.
Technical specialty (type CR to see list): 1 – ecology 2 – health science 3 – air quality 4 – surface water 5 – groundwater 6 – sociology 7 – economics 8 – earth science 9 – land use 10 – noise 11 – transportation 12 – aesthetics 13 – energy and resources	The computer then needs to know what Technical Specialty the user is interested in. In this case the user depressed the carriage return key to see the list of Technical Specialties.
technical specialty (type CR to see list): 1 you have chosen ecology	Since the user is interested in the Ecology Technical Specialty he/she depresses the key number 1. The computer then explains that the user has chosen the Ecology Technical Specialty.
detail (type d) or review (type r): r	The user is now asked whether he/she wants detail or review level output. In this case the user then depressed r to indicate review level.
Program number (type '_' if none, CR to see list): 1 MISSION CHANGE RESPONSES	The next two requests for information from the user specify input of a "program number" and a "subprogram number." These two numbers are used to indicate responses to a set of programs, subprograms, or "prefilter" questions printed in the text of the User Manual. The input forms may call this section the "BAAP Filtering Mechanism." The user's responses are shown on p 10. But how did these questions tie in with the interactive request for a program number? Since early publication of the Mission Change User Manual does not give any further help, the user depresses the return button to get a list of available programs. (The "BAAP Filter Questions" reduce the numbers of activities listed on the matrix with all activities listed; if he/she had pressed the hyphen, he/she would have been directed immediately to the QUESTION AND ANSWER session for Technical Specialty filter questions.)
program number (type '_' if none): 1	Since only one program exists, the user depresses the key number 1.

Figure 7. (cont'd).

The computer now asks for a subprogram number, and again the user presses the carriage return. The computer prints a list of subprograms and the user finds that each subprogram lists question responses associated with it.

subprogram number (type CR to see list)
1 1B – 3C
2 1B – 3A
3 1B – 3B
4 1A – 2A – 3A
5 1A – 2A – 3C
6 1A – 2B – 3B
7 1A – 2B – 3C
8 1A – 2C – 3A
9 1A – 2C – 3B
10 1A – 2C – 3C

For the Mission Change Functional Area, the list of answers corresponds with answers to the BAAP Filtering Mechanism, item 5 on the input form (p 10). The questions summarized on p 9 are printed in full in the User Manual.

Since the user answered question 1 with response "A," question 2 with response "B," and question 3 with response "C," he/she would find that set of answers in the list and then enter the associated program number, "7" in this case.

subprogram number: 7
QUESTIONS AND ANSWERS SESSION:

So the user depresses the key number 7.
The user now starts the filter question and answer session.

Would you like to have some directions? Yes.

The computer then asks if the user would like some directions. Since this is the first time the user has used the system he/she responds yes.

For a question set, enter all answers in string.
Separate each answer in the string by at least one space.
One answer for each question is assumed. A '?' in place of an answer will produce that question's printout.
Answer with a 'd' if no choice of answers fits the question or if a request is given to skip the question (as in RDT&E).

After giving directions on how to answer, the computer needs input for the filter questions. The computer asks for these answers. Note: a "string" is a row of characters followed by a carriage return.

Enter 14 answer(s) to ecology question(s): 2 2 2 ? 4 3 3 3 3 1 1 1 3 3

The user then inputs all the answers for ecology. All of the answers are on the same line, separated by at least one space. For this example, we have answered question 4 with a ? mark.

4. Which of the following statements best describes any areas which have previously been used for training or support activities and in which the intensity of these activities will increase?

1. Extensively modified by construction, grading, paving, landscaping, etc.
2. Regularly used by men, vehicles, and/or weaponry for field training for more than 20 days per year during at least 2 of the last 5 years.
3. Infrequently and lightly used by men, vehicles, and/or weaponry for field training. Average usage for each of the last 10 years has been 10 days or less.
4. No increase

The computer has then printed out question 4.

Figure 7. (cont'd).

enter answer again for question 4: 1

The system then asks for the answer to question 4. If the user did not know the answer to this question, he/she could have entered a zero.

Please wait.

The user is now asked to wait while the system compiles the answer. This wait is only a matter of several seconds.

ATTRIBUTES

1 natural setting
2 game animals
3 game fish
4 rare or endangered species
5 increase in undesirable species
*10 impacts on game animals
*11 encroachment on natural habitats
*12 threatened species

* preceding attributes are CONTROVERSIAL

The computer now begins printing:
List of Attributes

ACTIVITIES

167 change time of vehicle operations
244 increase sewer usage
245 increase refuse disposal usage
255 decrease refuse disposal usage
292 demolish facilities

List of Activities

MATRIX

MATRIX

	attributes	
	1 1 1 1 2 3 4 5 0 1 2	
b 167	B A C B B B A	2135
a 244	B A B A C B C	2244
a 245	B C C A C B C	2245
p 255	C	2255
s 292	C C	2292

What program? (Type <cr> to see list)

Since the user is now finishing, he/she depressed the control and d key at the same time.
(usually abbreviated as ctrl-d)

Figure 7. (cont'd).

4 SUMMARY AND RECOMMENDATIONS

This report has provided detailed information on accessing EICS interactively. All necessary commands and accession instructions are included. A typical example was provided to illustrate system usage.

It is recommended that interactive EICS be used as an aid for preparing EIAs/EISs when information must be obtained quickly, and that the instructions provided in this report be used to insure the most efficient use of the system.

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